Remarks

Claims 19-40 are pending. Claims 19, 20, 35, 36, and 40 have been amended. Reconsideration and allowance are requested in view of the above amendments and the remarks below. Applicants do not acquiesce in the correctness of the objections and rejections and reserve the right to present specific arguments regarding any rejected claims not specifically addressed. Furthermore, Applicants reserve the right to pursue the full scope of the subject matter of the original claims in a subsequent patent application that claims priority to the instant application.

Claims 20, 36, and the specification have been amended to change several instances of the term “discreet” to “discrete.” Accordingly, withdrawal of the objections to claims 20, 36, and the specification is requested. No new matter is believed added.

Claims 20 and 21 are rejected under 35 U.S.C. 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner asserts that the specification prohibits an embodiment that includes discrete capacitors as presented in claim 20. In support of this position, the Examiner points to the following portion of a sentence in Applicants’ specification: “the coupling capacitances 22, 32, 42 must not necessarily be discrete capacitors.” (Office Action at page 3). Applicants respectfully disagree with the Examiner’s interpretation.

Applicants submit that the above-referenced sentence portion actually discloses that the coupling capacitances 22, 32, 42 can be discrete **or** non-discrete capacitors. This is clearly supported in Applicants’ specification. For example, Applicants disclose that the coupling capacitances 22, 32, 42, can be constructed as discrete capacitors 23, 33, 43. (Specification at last paragraph; FIG. 9). Applicants also disclose that the coupling capacitances 22, 32, 42, can be formed in a non-discrete manner. (Specification at page 17, second full paragraph; FIG. 6). Accordingly, Applicants request withdrawal of the rejection under 35 U.S.C. 112, second paragraph.

Claims 19-40 are rejected under 35 U.S.C. 103(a) over Lambert (6,724,324), Kawahara (6,462,563), and Eichelberger (4,290,052). This rejection is defective because Lambert, Kawahara, and Eichelberger, taken alone or in any combination, fail to disclose each and every feature set forth in the claims as required by 35 U.S.C. 103(a).

The present invention relates to a device and a method for the capacitive position finding of a target object.

The present invention relates to the provision of coupling capacitances which, together with capacitive probes, in each case form capacitive voltage dividers. The capacitances of the probes with respect to the environment and the coupling capacitances in each case forming a capacitive voltage divider, with the probe voltages as the middle voltages of the capacitive voltage dividers. (Specification at page 14, second full paragraph; FIG. 1). In accordance with the present invention, the coupling capacitances **remain uninfluenced** by an approaching target. (*Id.* at paragraph spanning pages 7 and 8; independent claims 19, 35, 40). Thus, according to the invention and unlike the prior art, there is not a direct supply to the capacitive probes, which can also be referred to as measuring probes. Instead, a voltage divider is built up via the coupling capacitances and the measuring capacitances.

Further, unlike Lambert, where the term coupling capacitances is understood to mean a capacitance, the coupling of which is varied by an approaching object, the term "coupling capacitances" in accordance with the present invention is understood to mean a "coupling in" capacitance. (Specification at page 7, fifth full paragraph). Thus, it is the capacitance by means of which the AC voltage is coupled onto the measuring probe.

Applicants agree with the Examiner that neither Lambert nor Kawahara disclose a voltage divider with a coupling capacitance that remains uninfluenced by an approaching target. (Office Action at page 4).

The Examiner argues that Eichelberger remedies the glaring deficiencies of Lambert and Kawahara.

Eichelberger discloses a capacitive “touch-panel” wherein, by means of an electrode 18b, a signal is coupled to an electrode 18a. (Eichelberger at FIG. 1b). Based on a capacitance $C_T$, which is changed by the touch of a finger, a signal is coupled on a

receiving electrode 18c, again by means of the electrode 18b. (*Id.* at FIG. 1b, column 4, lines 5-34).

One fundamental difference between the present invention and Eichelberger is that no **middle** voltage of the capacitive voltage dividers constituted by the capacitances $C_R$ and $C_T$, and $C_{RC}$, and $C_T$, respectively, is being evaluated and measured by Eichelberger. To this extent, even assuming, *arguendo*, that the combination of Lambert, Kawahara, and Eichelberger is proper, the resultant combination still fails to disclose each and every feature set forth in independent claim 19 (see also independent claims 35 and 40).

The Examiner further argues that a person skilled in the art would be motivated to modify a combination of Lambert and Kawahara in view of Eichelberger insofar that the coupling capacitance 22 in the configuration of Lambert would **remain uninfluenced** by an approaching target. (Office Action at pages 4-5). Applicants disagree.

The change in the measured coupling capacitance $C_{AB}$ 22, when an object approaches, is an essential and fundamental part of Lambert's invention. (Lambert at column 3, lines 20-52; FIGS. 1 and 2). In particular, Lambert discloses that when a person's hand 20 approaches the electrodes, the measured capacitance $C_{AB}$ 22 decreases. (*Id.*). To this extent, one skilled in the art would not abandon this principle and use a completely different principle of measurement, such as the one disclosed by Eichelberger. This would require a complete redesign of Lambert's invention.

Applicants further submit that, contrary to the Examiner's assertions, Eichelberger does not unambiguously disclose that the coupling capacitance $C_{TR}$ is uninfluenced when the touch panel is touched by a finger. Although Eichelberger discloses that the coupling capacitance $C_{TR}$ is a function of the area of the transmitting electrode 18b, the thickness T and the dielectric constant of the insulative layer 16, Eichelberger does not disclose that these are the "only" factors that may influence the value of the coupling capacitance $C_{TR}$. (Eichelberger at column 3, lines 60-68). Thus, the Examiner's assertion that the coupling capacitance $C_{TR}$ is a function "only" of the area of the transmitting electrode 18b, the thickness T and the dielectric constant of the insulative layer 16 is unsupported and inaccurate.

Returning to Lambert, Applicants submit that Lambert does not disclose a capacitive voltage divider as argued by the Examiner. (Office Action at page 3). On the contrary, Lambert discloses a much different capacitive arrangement. In particular, nowhere in Lambert is there disclosed an invariant coupling capacitance, wherein the capacitances of probes to the environment together with the coupling capacitances in each case forming a capacitive voltage divider with the probe voltages as middle voltages of the capacitive voltage dividers, and wherein the probes are in each case connected across the coupling capacitances to a voltage supply and can be supplied with a supply voltage. (Independent claim 19). Instead, Lambert discloses a network including a parasitic capacitance 22, which is positioned directly between an AC source 24 and a detector 26, and two stray capacitances 32, 34, that change when an object approaches the sensor in a rather undefined geometric area. (Lambert at FIG. 1).

The stray capacitances 32, 34 in Lambert, according to description of FIG. 13 (column 12, lines 3 to 8), are not of any relevance with respect to the principle of measurement used by Lambert. That is, Lambert fails to describe the function of a voltage divider. Rather, only the current 72 through the capacitance 22 is evaluated by operational amplifiers 116 and 74. (Lambert at column 8, lines 65 to 67).

A further difference between Eichelberger with respect to Lambert is described in column 4, lines 26-31 of Eichelberger. Specifically, Eichelberger describes a so-called “T”-structure, whereas in Lambert a “PI”-structure is described. While the assembly of electrodes may, at first glance, look similar, it also reflects the differences as compared to Lambert and the present invention. For example, in Eichelberger, two electrodes must oppose each other within the area of a third electrode, since the measurement distance is obtained by the detour via a third electrode and not by any two neighboring electrodes.

Eichelberger also fails to disclose the evaluation of a voltage. Due to the pulsed excitation used by Eichelberger, it follows that an evaluation of the time dependence of the response voltage is necessary. In other words, the decay behavior of the voltage must be observed.

Kawahara discloses a three dimensional assembly of electrodes which are driven electrostatically, i.e., not with an AC-current but rather with switched voltage levels. It is

not possible to realize this with signal-feeding coupling capacitances, since the DC-impedance of a capacitance is very large. Furthermore, Kawahara does not disclose how a measurement of a plurality of capacitances can be performed statically or how such measurement results could be evaluated. In particular, Kawahara fails to disclose a "probe voltage" of any type.

Applicants note that the "voltage divider" pointed out by the Examiner at page 4 of the Office Action is not described in column 6, line 27 nor elsewhere in Kawahara.

In view of the above-referenced deficiencies of Lambert, Kawahara, and Eichelberger, it is clear that each reference relates to fundamentally different configurations, which one skilled in the art would not have combined in the manner suggested by the Examiner. In particular, even an arbitrary combination of the technical teachings of Lambert, Kawahara, and Eichelberger would not lead to a feasible capacitive position sensor in accordance with the present invention.

Accordingly, Applicants submit that independent claims 19, 35, and 40, and their corresponding dependent claims, are allowable.

With respect to the dependent claims, Applicants herein incorporate the arguments presented above with respect to the independent claims from which the claims depend. The dependent claims are believed to be allowable based on the above arguments, as well as for their own additional features.

If the Examiner believes that anything further is necessary to place the application in condition for allowance, the Examiner is requested to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,

/ John A. Merecki /

Dated: May 18, 2010

John A. Merecki
Reg. No. 35,812

Hoffman Warnick LLC
75 State Street, 14th Floor
Albany, NY 12207
(518) 449-0044 - Telephone
(518) 449-0047 - Facsimile